

I Claim

Claims

1. Directional solidification casting apparatus, comprising a casting furnace having an open lower end through which a mold disposed on a chill member is moved by a ram, a thermal baffle member supported on said ram and positionable at said lower end of said casting furnace by movement of said ram toward said casting furnace, and spring means for retaining said thermal baffle member at said lower end as said ram positions said mold in said casting furnace and as said ram withdraws said mold filled with molten metallic material away from said casting furnace for directional solidification of said molten metallic material in said mold.
2. The apparatus of claim 1 wherein said ram carries a chill member on which said mold is disposed.
3. The apparatus of claim 2 including a support member disposed on said ram for movement therewith as said mold is placed in and then withdrawn from said casting furnace.
4. The apparatus of claim 3 including a plurality of upstanding support elements disposed on said support member, said upstanding support elements supporting, proximate their upper ends, said thermal baffle member.
5. The apparatus of claim 3 wherein said spring means is disposed between said chill member and said support member.
6. The apparatus of claim 5 wherein said spring means comprises one or more coil springs having a housing fixed on an underside of the chill member and a movable coil spring element having one end connected to said housing another end that is connected to said support member.

7. The apparatus of claim 1 including a second thermal baffle member positionable at said lower end of the casting furnace adjacent said thermal baffle member and spring means for retaining the second thermal baffle member at said lower end as said ram withdraws said mold filled with molten metallic material away from said casting furnace for directional solidification of said molten metallic material in said mold.

8. The apparatus of claim 7 wherein the second thermal baffle member includes an opening for movement of the mold therethrough and having a configuration different from an opening in said thermal baffle member for movement of the mold therethrough.

9. A method of directional solidification of a molten metallic material in a mold, comprising moving a ram on which said mold is disposed toward an open lower end of a casting furnace, carrying a thermal baffle member on said ram as it moves toward said lower end to position said thermal baffle member at said lower end, continuing moving said ram relative to said thermal baffle member at said lower end to place said mold in said casting furnace, providing a molten metallic material in said mold, and withdrawing said mold filled with said molten metallic material from casting furnace for directional solidification of said molten metallic material in said mold while spring means biases said thermal baffle member in a direction toward said lower end to retain it at said lower end.

10. The method of claim 9 including disposing said mold on a chill member on said ram.

11. The method of claim 9 including disposing said spring means between said chill member and said support member to maintain said bias on said thermal baffle member.

12. The method of claim 11 wherein said spring means comprises one or more coil springs having a housing fixed on an underside of the chill member and a movable coil spring element having one end connected to said housing another end that is connected to said support member.

13. The method of claim 12 including continuing to bias the thermal baffle member against said lower end until each said coil spring means is retracted.

14. The method of claim 13 including further lowering said ram to disengage said thermal baffle member from said lower end.

15. The method of claim 14 including replacing said thermal baffle member with another new thermal baffle member.

16. The method of claim 9 including moving a second thermal baffle member as said ram moves toward said lower end to position said second thermal baffle member at said lower end adjacent said thermal baffle.

17. The method of claim 16 including spring biasing the second thermal baffle member in a direction toward the lower end of the casting furnace as the mold is withdrawn from the casting furnace.

18. The method of claim 17 including engaging the mold with the second thermal baffle member as the mold is withdrawn so as to move the second thermal baffle member away from the lower end of the casting furnace.